B2

9. (Amended) Method according to claim 1 wherein a target preform is maintained at a temperature higher than about 700°C.

REMARKS

Claims 1-14 are presently under consideration. Applicants propose to amend claims 1, 2, 8, and 9 to improve form and not for reasons of patentability. In the Office Action, the Examiner rejected claims 1-14 under 35 U.S.C. § 103(a) as being unpatentable over Kuisl (U.S. Patent No. 4,650,693).

I. Rejection of Claims Under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-14 under 35 U.S.C. § 103(a) as being unpatentable over Kuisl, alleging that "[E]ven though Kuisl indicates that 1 is a reaction chamber, any other chamber in which the reaction occurs can be considered a reaction chamber." The Examiner, however, provides no support that any other structure in Kuisl operates like the reaction chamber disclosed and claimed by Applicants.

A reaction chamber is a standard device well known and defined in the art. Kuisl, in discussing the operation of its process, states:

> In chamber 1 diffusion produces a gas and/or vapor mixture which is converted by chemical reaction to an aerosol, the aerosol stream 10. This chemical reaction may be initiated, for example, by the heat generated in a furnace 60, arranged around the reaction chamber. The resulting essentially laminar flow aerosol stream 10 is now conducted with an envelope of an aerosol particle free gas and/or vapor stream 20, which is now conducted with an envelope of an aerosol particle free gas and/or vapor stream 20, which is introduced to surround the aerosol stream 10 through the inner concentric conduit 41 (col. 1, lines 50-60).

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It is clear from Kuisl that no disclosed structure other than its reaction chamber 1 is or functions as a reaction chamber. Pipes 21 and 31, for example, only "conduct gaseous and/or vaporous components in laminarly flowing streams symbolized by arrows 2 and 3, into a reaction chamber 1" where they mix and react (col. 1, lines 47-50). Clearly pipes 21 and 31 are not and do not function as reaction chambers.

Pipe 41 is described only as a conduit for aerosol particle free gas and/or vapor stream 20 (col. 1, lines 55-60) as opposed to Applicants' aerosol stream 10 which is produced by the chemical reaction which occurs in reaction chamber 10. Therefore, pipe 41 is not and does not function as a reaction chamber.

Furnace 60 is described as surrounding the reaction chamber 1 and functions only to supply heat. Kuisl states it "serves merely to heat the walls of pipes 21, 31, 41 and/or vapor or gas stream 20" (col. 4, lines 53-54). Clearly, furnace 60 is not and does not function as a reaction chamber.

In short, there is no structure discussed in Kuisl, other than reaction chamber 1, that is a reaction chamber, or that functions as or is capable of functioning as and producing the results of a reaction chamber.

Moreover, claim 1 recites that the reaction chamber comprises a heatable inner wall which is subjected to a controlled temperature gradient to cause a temperature increase from the inlet zone to the outlet zone of the reaction chamber. This is described in the specification (see, e.g., page 4, lines 27-30; page 20, lines 14-26, and page 22, line 19 to page 23, line 4). The Examiner alleges that a temperature gradient exists in furnace 60 or pipe 41 of Kuisl because the gasses are heated to 800-1000°C,

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pipe 41 is heated to 1200°C, and stream 20 can be heated to a temperature higher than 1200°C. Applicants disagree with the Examiner's position. Kuisl does not disclose the Applicants' claimed temperature gradient.

Specifically, Kuisl discloses that "furnace 60 then serves merely to heat the walls of pipes 21, 31, 41 and/or vapor and/or gas stream 20 to a temperature which is higher than the reaction temperature" to provide the thermophoresis effect (col. 4, lines 52-59). This thermophoresis effect generates "radially directed forces" that guide the particles toward the longitudinal axis of aerosol stream 10 (col. 4, lines 33-40). Kuisl, however, fails to disclose that furnace 60, pipe 41, or stream 20 affect the temperature in reaction chamber 1 such that a temperature gradient increases the temperature from an inlet zone to an outlet zone as recited in claim 1 of the present invention. In particular, Kuisl fails to teach the application of a temperature gradient to the inner wall of the reaction chamber from an inlet zone to an outlet zone in the direction of the reactants within the reaction chamber.

As stated on page 20, lines 8-13 of the present application "By effect of the heating elements surrounding the reaction chamber, suitably disposed to generate increasing temperatures from the inlet of the reaction chamber in the direction of the preform, a gradient of temperature in the longitudinal direction of the reaction chamber is thus generated". Kuisl only teaches heating the components to the required reaction temperature of 800-1000°C (col. 4, lines 46-48) while heating the walls of pipes 21, 31 and 41 to a temperature higher than the reaction temperature, e.g. 1200°C, through furnace 60 (col. 4, lines 54-56). A constant temperature of the inner walls as in Kuisl,

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however, may cause undesirable deposition of soot particles on the walls of a reaction chamber. The increasing temperature from the inlet zone to the outlet zone provided on the inner walls according to the present invention avoids this problem.

The disclosure of Kuisl provides no hint or suggestion of applying a controlled temperature gradient to the inner wall of the reaction chamber. To the contrary, Kuisl teaches away from a controlled temperature gradient because Kuisl describes heating the tubes to a particular constant temperature. As admitted by the Examiner (page 3, lines 3-5 of the Office Action): "If a reference discloses heating something to a particular temperature, one usually expects that the entire feature ought to be heated to that temperature--not just one portion of the body". Clearly, this does not constitute a teaching of a temperature gradient along the inner wall of a reaction chamber nor does it provide a motivation to do so.

The Examiner also alleges that "it would have been obvious to heat at least the rightmost ends (if not the entirety) of 41 and 60 to be at the disclosed temperature, asserting that the entire length of furnace 60, pipe 41, and stream 20 are likely heated to the disclosed temperatures. This is an unsupported interpretation of the Kuisl disclosure. Again, Kuisl fails to disclose a temperature gradient such that the temperature increases from an inlet zone to an outlet zone, and it certainly does not teach the temperature gradient recited in claim 1 of the present invention operating on the inner wall of the claimed reaction chamber.

Even assuming that the "reaction chamber" proposed by the Examiner were to be considered the interior of Kuisl furnace 60, no temperature gradient having a

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temperature that increases from an inlet zone to an outlet zone exists in Kuisl. If "the entire feature" of furnace 60 is heated to the temperature disclosed by Kuisl, as the Examiner asserts, then either the entire chamber defined by furnace 60 is at that temperature or a region adjacent to the wall of furnace 60 is at that temperature. Either way, Kuisl fails to disclose or suggest a temperature gradient such that a temperature increases from an inlet zone to an outlet zone of the reaction chamber as recited in claim 1 of the present invention.

For the reasons discussed above, Kuisl does not disclose nor render obvious the invention claimed in claim 1. Accordingly, Applicants request that the Examiner reconsider and withdraw the rejection of claims under 35 U.S.C. § 103(a). Applicants submit that claim 1 is in condition for allowance, as are claims 2-14, at least by virtue of their dependency on allowable claim 1.

II. Conclusion

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 1-14 in condition for allowance. Applicants submit that the proposed amendments of claims 1, 2, 8 and 9 do not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

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Finally, Applicants submit that the entry of the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicants submit that this claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
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Dated: September 11, 2002

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APPENDIX TO AMENDMENT OF SEPTEMBER 11, 2002

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

1. (Twice Amended) Method for manufacturing a glass preform by depositing an aerosol stream of glass particles onto a target, which comprises:

– providing a reaction chamber comprising an inlet zone [and], an outlet zone, and a heatable inner wall, wherein [an inside] said inner wall of [the] said reaction chamber [has a] is subjected to a controlled temperature gradient [such that] to cause a temperature [increases] increase from [the] said inlet zone to [the] said outlet zone of said reaction chamber;

– supplying a first gaseous or vapor phase composition disposed to provide a hydrolyzable glass precursor to [the] said inlet zone of [the] said reaction chamber;

– supplying water as a second gaseous or vapor phase composition to said inlet zone of the reaction chamber;

– reacting the water and the first gaseous or vapor phase composition in the reaction chamber to form an aerosol of glass particles;

– directing [the] said aerosol along said reaction chamber and through [an] said outlet zone of said reaction chamber onto a target on which the preform is formed; and

– depositing [the] said aerosol on the target.

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2. (Amended) Method according to claim 1 wherein a difference of temperature of at least about 100°C is provided from said inlet <u>zone</u> to said outlet <u>zone</u> of the reaction chamber.

8. (Amended) Method according to claim 1 wherein [the] <u>a</u> temperature of [the] <u>an</u> aerosol stream being directed through the reaction chamber increases from about 700°C at the inlet <u>zone</u> to about 1200°C at the outlet <u>zone</u> of said <u>reaction</u> chamber.

9. (Amended) Method according to claim 1 wherein [the] <u>a</u> target preform is maintained at a temperature higher than about 700°C.

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